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THE MAGNAVOX COMPANY, et al.,

Plaintiff,

vs.

CHICAGO DYNAMIC INDUSTRIES
and SEEBURG CORP.,

Defendants.

No. 74 C 1030
and
74 C 2510

BEFORE: The Honorable JOHN F. GRADY, Judge.

Thursday, December 30, 1976

10:10 o'clock a.m.

Resumed pursuant to adjournment.

PRESENT:

MR. ANDERSON
MR. WILLIAMS
MR. ALLEGRETTI
MR. BRIODY

MAR 2 - 1977
H. Stuart Cunningham, Clerk
United States District Court

appeared for The Magnavox Company

MR. GOLDENBERG
MR. RIFKIN

appeared for the Seeburg defendants and
World Wide Distributors.

ALSO PRESENT:

MR. GEORGE R. PETTIT
Magnavox

THE CLERK: Case No. 74 C 1030 consolidated with case 74 C 2510, The Magnavox Company, et al., v. Chicago Dynamic Industries and Seeburg Corp., case on trial.

THE COURT: Good morning, gentlemen.

MR. ANDERSON: Good morning, your Honor.

We will recall Professor Ribbens to continue his testimony.

Your Honor, at the end of the session yesterday I handed up a rather extensive set of documents, including color brochures, circuit diagrams and the like.

I noted that I omitted one of the group, which, just for the record, I would like to identify and add to the group. Those are the documents relating to a game made and sold by Chicago Dynamics Industries, called TV Tennis, a two-player or four-player game, and it is shown in a color brochure, Plaintiffs' Exhibit 36-B, and a parts list, Plaintiffs' Exhibit 36-D, a parts catalog, Plaintiffs' Exhibit 36-C, and a circuit diagram, Plaintiffs' Exhibit 36-A.

The parties also have agreed on a stipulated glossary of terms. The defendants prepared and submitted one. We discussed certain variations and additions, and it has been agreed to, and I brought it over this morning, with one error in it, and it will be corrected over here in an hour or two, and we will hand it up to the Court.

THE COURT: I think today we will plan to recess at 4:30. I hope your case will be finished by then, but if it is not --

MR. ANDERSON: If it isn't, your Honor, I think we have Dr. Ribbens and then one additional witness, Professor Cayton, and I think that at the worst it would run into --

THE COURT: Is he from out of town?

MR. ANDERSON: He is from Washington, but that is quite all right.

THE COURT: Well, we will see how we go. We will see how we move along.

MR. ANDERSON: Actually, I would appreciate the 4:30 closing.

THE COURT: You would?

MR. ANDERSON: Yes, because our people, and I'm sure theirs, hope to travel tonight and return to their homes.

THE COURT: My thought is that at the conclusion of the evidence next week I will hear from counsel orally, and I might rule then, or I might take a following date to rule. I may want to go over my notes and the cases you have cited.

Bearing in mind that I have read your pretrial memoranda, you can bring with you any additional citations or argument.

There is one citation that I wish you would look at. It has to do with a case that I tried a portion of recently which had previously been tried by another judge, and on remand it was reassigned to me, and I handled a portion of it, and it is the case of CTS v Piher, reported at 527 Fed. 2d 95. It happens to involve a potentiometer. The facts of the case have nothing to do with the facts here, but the issue that I would like you to look at the case in connection with is the issue of validity.

It seems to me that that case does -- or may have some bearing on the validity issue here, and I would like to have counsel's impression of that.

Then, since I know you gentlemen will be thinking about this case over the weekend and working on it, I would like to have, in connection with Mr. Goldenberg's argument at the close of the case, any

case you can find which has denied validity to a brand new product on the basis that although the product is brand new, it's simply a combination of old elements.

Now, if it turns out -- and I certainly haven't heard the defense case -- but if it turns out this is, indeed, the first TV game, and, notwithstanding that the defendant contends that it's simply a combination of old elements with nothing new, I would like you to cite me a case for that. I don't know whether there is or is not such a case, but I'm sure if there is, you know about it, or at least can find it.

I don't mean to imply that these matters I mention are any more important than any that occur to you, but they are a couple of things that occur to me.

Thank you.

MR. ANDERSON: Thank you, your Honor.

I am familiar somewhat with the decision in CTS v Piher, and, as I recall it, at least in part -- the part that struck me the most, I think, was the Court of Appeals' comments on Judge Hoffman's evidence rulings and the admissibility -- inadmissibility of some Motorola evidence.

Is it with respect to evidence rulings that you are concerned, by chance?

THE COURT: No. Basically what it seems to me may be pertinent to the instant case is the holding of the Court that although the particular device in question was not new, and the thing which the plaintiff had done with it was not new, nonetheless the plaintiff was doing that thing for a new purpose, and that fact made it patentable.

Specifically, what you had was a potentiometer that had a driver on it, which is the long shaft part of the potentiometer, and the end of the shaft was flared over so that it covered the housing of the potentiometer itself in such a way as to provide a dustproof seal, and the Court said that, although there had been previous potentiometers which had the flare bearing, as they called it, which is exactly what you had here, a flared bearing, it had not been for the purpose of providing a dustproof seal. No one had ever thought of it in that connection.

Now, the obvious possible analogy in this case is that if all the technology we are dealing with here is old, does the CTS against Piher case teach us that the application of that technology for a new purpose is patentable? That's just something that suggested itself to me, and I would like you to address yourself to it.

All right.

Ribbens - direct

MR. ANDERSON: Thank you, your Honor.

WILLIAM BENNETT RIBBENS,

called as a witness by the plaintiff herein, having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Resumed)

BY MR. ANDERSON:

Q Dr. Ribbens, in the course of your preparation to testify in this action have you considered and studied the agreed statement of facts entered into between the parties which relates to the classification of accused games and some of the operation of the accused games?

A I have.

Q Have you studied the documents, the color brochures, circuit diagrams and the like, which I have handed up to the Court in preparation to testify?

A Yes, I have.

Q From your study and preparation, can you explain the operation of the game called Paddle Ball, manufactured and sold by Seeburg, as it relates to the patents in suit?

A Yes, I can.

Q Would you do that, please?

A Yes.

Ribbens - direct

(There was a short interruption, after which the following further proceedings were had herein:)

MR. ANDERSON: I have placed on the easel Plaintiffs' Exhibit 19-A.

THE COURT: Can you hold it just a second? I am looking for those specific exhibits.

(There was a short interruption, after which the following further proceedings were had herein:)

THE COURT: We are going to start on Paddle Ball?

MR. ANDERSON: Yes.

THE COURT: The other one that was representative was what?

MR. ANDERSON: Pro Tennis, your Honor, the Group B specific example.

THE COURT: All right.

MR. ANDERSON: Your Honor, we have prepared duplicates of the colored chart, Plaintiffs' Exhibit 91-A, one of which I will hand to the Court, the other of which I would like to merely loan to Mr. Goldenberg, if I may, for his use at this time. They are the only ones that we have.

BY MR. ANDERSON:

Q Professor Ribbens, what is Plaintiffs' Exhibit 91-A?

A Plaintiffs' Exhibit 91-A is a schematic diagram of a game called Paddle Ball, and this is a circuit which when used with a television receiver is capable of displaying symbols, which are useful for playing an interactive game.

If I might take a moment or two, I can describe my findings in terms of certain sections of this schematic diagram which performs specific functions, which we can identify in the light of the teachings of the patent Reissue 28,507.

I have taken the trouble to have color-coded the sections of the schematic diagram.

THE COURT: Go ahead.

BY THE WITNESS:

A I thought I would wait until you were seated, and then I can point to these sections.

For example, there is a section at the upper left of Exhibit 91-A, which is outlined in purple, and which we have labeled "Hitting Symbol." This is a collection of components which in connection with a synchronizing generator is capable of generating a signal, which will display a spot on the screen under

player control.

The player control is brought into this schematic by virtue of the potentiometer at the upper left, labeled "Left," and just underneath it you will find a "5K". That refers to the value of the potentiometer.

As you have mentioned earlier that you are familiar with potentiometers --

THE COURT: Not really.

BY THE WITNESS:

A -- you will know that a shaft comes out of the potentiometer and a knob can be attached to the potentiometer so that it can be rotated. By rotating of the knob, the player has control over the vertical position of this spot on the television receiver.

This is analogous to the Spot 1 Generator or Spot 2 Generator of Exhibit 89, which is Fig. 12A of Reissue '507.

I have found that this circuit diagram, by virtue of the components at the lower right, generates a number of frequency components, two of which are horizontal and vertical synchronizing signals.

So I would view just broadly speaking a number of the components which I have not taken the trouble to encircle as being devices which are analogous to both the vertical sync and the horizontal sync generators 115 and 116 of Exhibit 89.

So there is indeed a connection between those components, and the group of components which I have outlined in purple and labeled "Hitting symbol".

I might mention in passing that there is a second hitting symbol which I have not outlined in purple just above the one which is outlined in purple.

BY MR. ANDERSON:

Q Dr. Ribbens, are they similar or identical?

A They are identical in both component and function.

They have two different labelings, of course, because they use different individual components. In fact, you will notice at the upper left, your Honor, that there is a potentiometer labeled "Left" and just to the right of it is a potentiometer labeled "Right", and these two independently control

a set of components which provide the function of generating a signal which bears a unique relationship to the horizontal and vertical synchronizing signals, and their display on the television receiver, as a rectangular white spot.

Q When you say they bear a unique relationship to the horizontal and vertical sync signals, Dr. Ribbens, what kind of relationship are you referring to?

A There is a time delay following the vertical synchronizing pulse, and in fact following the horizontal synchronizing pulse, at which the signal will be prepared or displayed -- excuse me; the player has control over the vertical time delay, following the vertical synchronizing pulse to the generation of the output signal.

In this particular schematic the horizontal position is fixed. There are a set of fixed components, and the second and smaller rectangle outlined in purple are circuits which generated the horizontal position control signal.

In addition, there are blocks which are outlined in orange on Exhibit 91-A, which we have chosen to label "Hit Symbol" and which generate a signal, which will display on the television receiver screen a rectangular spot, which is movable under game control. These also derive their information, that is, their positional information, from the group of components which derive horizontal and vertical synchronizing pulses, and I might just call to your attention the fact that I have color coded the lines which lead from these symbol generators to the output in yellow. The output of the hit symbol generator is a device which is labeled "G1B". There is a yellow line leading from that through a group of components, F2B, E4F, 1K resistor, and over to a 5Mf, capacitor.

The point at which the yellow lines come together is the output, which goes to the television receiver. You will find that point labeled "Video". There is a little rectangular box labeled "19" in Exhibit 91-A.

This group of components outlined in orange called "Hit Symbol" is analogous to the Spot 3 Generator of Exhibit 89, in that it is capable of displaying on the television receiver screen a symbol which is movable

Ribbens - direct

and under game control, that is, control of the game electronics.

The way in which the game is played is analogous to the game of Exhibit 89, a ping pong or tennis type of game, in which the players manipulate the position of the symbol under their control, such as to cause coincidence with the symbol generated by the hit symbol.

Upon coincidence with either one or the other hitting symbol and the hit symbol, the motion of the hit symbol is altered.

Now, we have identified the portions of the circuit in which coincidence is determined in a dashed orange line and labeled "Hit/Hitting Coincidence" at the upper left of Exhibit 91-A.

So the small rectangle labeled "Hit/Hitting Coincidence" provides the function of the coincidence detector numbered 121 in Exhibit 89, as taught by Patent 28,507.

In addition, the result of this coincidence provides --

THE COURT: Will you tell me again what it is that mechanically is analogous to the coincidence detector?

THE WITNESS: I am sorry. What was the question?

THE COURT: What is there in the Paddle Ball game that is the mechanical equivalent of the coincidence detector?

THE WITNESS: You mean the electrical equivalence?

THE COURT: Right.

THE WITNESS: The functional equivalence would

be the rectangle labeled "Hit/Hitting Coincidence". This circuit --

THE COURT: Do they work in essentially the same way as the coincidence detector?

THE WITNESS: I believe they work in exactly the same way, to the extent that they detect the simultaneous occurrences of the signal corresponding to either hitting symbol and the hit symbol.

BY MR. ANDERSON:

Q Could you amplify that, Dr. Ribbens, by just pointing out the -- functionally, the inputs and the outputs to the coincidence detector --

A Yes.

Q -- in Exhibit 89, Figure 12A of the '507 patent, and then, if you can, equate that in whatever way is possible to the Paddle Ball coincidence detector.

MR. GOLDENBERG: Your Honor, that is leading, isn't it? And I do object to the question.

I understand the Court yesterday expressed a view on that but --

THE COURT: Well, I feel this way about leading, though, in connection with a witness of this kind: It's really calling his attention to something --

MR. GOLDENBERG: It's a little more --

THE COURT: It's obviously within his knowledge. I can't believe that he is going to say something about these schematics here that isn't there, simply because Mr. Anderson suggests it is there.

MR. GOLDENBERG: No, and I don't believe that would happen, but, on the other hand, your Honor, I think what the Court is entitled to have is the witness' knowledge and understanding and --

THE COURT: Well, I think that's true.

On the other hand, since I'm really interested in learning what the facts are, if there's something that the witness doesn't know which he can be asked about and will agree with on the basis of his general fund of knowledge, I see no harm in that, either, bearing in mind that we are dealing with an expert witness here.

MR. GOLDENBERG: I can understand that, but we are dealing with an area of controversy between the parties and -- well --

THE COURT: Well, I can see something to be said on each side of the question, perhaps, but --

MR. ANDERSON: If I may, your Honor --

THE COURT: Yes.

MR. ANDERSON: In addition to, I think, the Court's observations, which I think are perhaps adequate without my adding anything, the witness has said that the two are substantially identical, I think -- that's what I heard him say -- and all I am saying is can you amplify that in a little more detail? That's all I intended to say, to equate the two in more detail.

MR. GOLDENBERG: You suggested to him, sir, as I understood the question, what his amplification

might include. I don't know that this would happen, but it's entirely possible the witness would have said something other than what Mr. Anderson had in mind.

THE COURT: You see, there's a way of doing all these things the long way, if you want to. You can ask the witness whether he has exhausted his knowledge. There's a way Mr. Anderson could lead him ultimately, anyway.

MR. GOLDENBERG: I suppose.

THE COURT: So, really, it seems to me, in the case of an expert witness, as distinguished from a lay witness, I think there is a very great distinction, a matter of form, I think, rather than substance.

Well, I will overrule the objection. Go ahead. I have forgotten what the question was.

THE WITNESS: I have, too, but I think basically what I was trying to do was show -- I was attempting to correlate observations which I have made about this schematic diagram with teachings of '507.

THE COURT: Well, I think we were about to go into a little more detail in regard to the precise analogy between the mechanics of this Hit/Hitting

rectangle in the case of Exhibit 91-A and the coincidence detector of the plaintiff's game, and you said they accomplished the same thing, and I am interested really in whether they accomplish the same thing in the same way or substantially the same way, and I think Mr. Anderson's question was directed to your --

THE WITNESS: I believe they do.

THE COURT: All right.

THE WITNESS: And Mr. Anderson was just suggesting perhaps that I point out that we have illustrated -- or there is illustrated in Exhibit 89 the coincidence detector having three inputs, and some connection between the coincidence detector -- this is a functional connection -- between the coincidence detector and the Flip-Flop.

It's necessary for the coincidence detector to have the information from the Spot 1, Spot 2 and Spot 3 pulse, and you will find that -- it's difficult to see, I think, without looking closely -- there's a connection between G2C, which is the output of the hitting symbol generator.

BY MR. ANDERSON:

Q Is that the one in the purple box?

A In the purple box. Pin No. 8 of G2C and pin 13 of Components G3D in the orange dashed line enclosed box labeled "Hit/Hitting Coincidence." That would be analogous to the connection between the Spot 1 Video Pulse and the Coincidence Detector as labeled in Exhibit 89.

Similarly, there's a connection, if you will follow the line at G1B, which is the end of the color coded yellow line, up. There's a connection between that an component G3D in the orange dashed enclosed

box labeled -- entitled "Hit/Hitting Coincidence."

Similarly, the same connection between G1B, the hit symbol generator and the hit/hitting coincidence block as we have identified it with the dashed orange line in Exhibit 91-A.

Q And is that shown in yellow?

A That's yellow. Thank you..

That is analogous to the connection between the Spot 3 generator or ball and the coincidence detector of Exhibit 89.

And just above, you will see the connection between G2A. G2A is the component which produces the output of the other hitting generator symbol and the Hit/Hitting Coincidence.

So, I believe there's a direct one-to-one correspondence between the function of this 91-A exhibit circuit and Exhibit 89.

Q Dr. Ribbens, as I understand, you have described now the three yellow inputs to the Hit/Hitting Coincidence box that you have marked.

Now, can you describe the relationship, if any, with respect to the output?

A Yes. The output consists of a number of blocks in different portions of schematic 91-A. They are also

outlined in a dashed orange line.

At the upper central portion of Exhibit 91-A is a block outlined with a dashed orange line labeled "Impart Distinct Motion (Horizontal)." This portion of the circuit generates control signals which influence the horizontal motion of the ball and cause it to reverse upon coincidence.

Similarly, there's a block outlined with dashed orange line at the lower left. This is included in the solid orange line identifying the hit symbol generator. We have labeled this portion "Impart Distinct Motion (Vertical)," so, as a result of coincidence between the hitting impart and the hit symbol, as produced in this upper rectangle, there will be a change in the circuit condition which influences the vertical motion of the ball.

Functionally, the ball's vertical motion will be changed depending upon what portion of the paddle coincidence is reached, and that's analogous to the influence of the motion on the ball as depicted in Exhibit 89, and as taught by Patent 28,507.

Upon coincidence in this particular example of Fig. 12A, there's a change in the control signals which influence the horizontal motion and the vertical motion of the ball.

The only other thing I might call attention to on this is the generation of horizontal and vertical sync. The lines might be a little difficult to see. They are smaller than the yellow, purple and orange lines, but they are red and blue, and we are maintaining the same color coding as we have used in previous exhibits with respect to the patents in suit.

Did you want to look at these, Mr. Goldenberg?

Beginning at component G5A there's a blue line, and beginning at H5B a red line. These correspond to the vertical and the horizontal synchronizing pulse, which we have described in previous exhibits such as Exhibit 89.

As taught by patent '507, the horizontal and vertical synchronizing pulses are brought together and superimposed with the video information with the color coded yellow and appear on the output and are delivered to the television receiver.

THE COURT: Where is the thing that corresponds to the summer?

THE WITNESS: That component would be essentially the combination -- there's a combination logic. The horizontal and the vertical synchronizing pulses are summed at this point in component A4D. They are combined by means of this resistance and that resistance at this point here (indicating).

The composite signal appears right at that point. The capacitor is a blocking capacitor to remove the DC components.

So, we have separately synchronizing

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information with one polarity and the signal information with the opposite polarity delivered to the television receiver.

The only other thing that I might mention is that I didn't choose to color code all of the components necessary to produce horizontal and vertical sync, because the figure would be very messy. I am only showing the output of the sync generators, the device G5A and component H5B, to produce horizontal and vertical synchronizing pulses. They are combined in A4D and are delivered to the output by components E4E and the 2.2K resistor. It's labeled on Exhibit 91-A "Sync," and just underneath it "(negative pulses)," indicating their polarity relative to zero.

However, the horizontal and vertical synchronizing pulses include the components at the lower right of Exhibit 91-A beginning with an oscillator at a frequency of 14.2 megahertz, and a series of components which divide the frequency of that oscillator successively down to lower frequencies.

So, there are a number of components on Exhibit 91-A which go to make up the equivalent of the vertical and the horizontal synchronizing generators of Exhibit 89.

BY MR. ANDERSON:

Q Dr. Ribbens, the graphics of Exhibit 91-A, the way it appears, are quite different from other diagrams that we have been looking at so far in this trial. Can you just, ingeneral, describe what the different graphic components are and what's inside the boxes or shaped devices?

A Yes, I can.

Q In a general way.

A Each of the blocks on here represents either an integrated circuit in its entirety or a part of an integrated circuit.

An integrated circuit is a package component which has a number of devices, basic electrical circuit components, transistors, diodes, resistors, included, and prepared by a manufacturer, and sold in such a way that it can be used as a system component.

I can buy individual integrated circuits. I needn't know anything about the detailed individual components inside, only the input-output relationships, the power supply, and the tolerance levels on those inputs and outputs.

So I can design from a purely functional standpoint using components such as are depicted by the rectangles and the various other symbols of Exhibit

91-A.

For example, component labeled P8 is a 7493. Now, if I weren't familiar with that, I could go to a catalog and look up 7493. I happen to know --

THE COURT: You mean it's a prefabricated circuit, is that --

THE WITNESS: Prefabricated circuit.

Do we have an example of those that I could show an actual integrated circuit?

MR. ANDERSON: In the back of the Pong game there's quite a few of them.

BY THE WITNESS:

A This panel is called an integrated circuit, and there are connections between the various components on it. These funny little spider-like devices are the integrated circuits themselves. This particular configuration is described as a dual in-line package, and the little silver-colored leads coming from the device actually represent the external connections to the device.

Inside of that package is a chip, usually silicon, on which the device -- individual transistor, resistor, diode, are mounted. It's necessary to provide power supply voltages to the device, and then there are various terminals, some of which may not be used, but,

depending upon the manufacturer, all of these connections may be used.

In some cases there will only be a power supply and a ground and one input and one output.

But, typically, the manufacturer, if he is doing a proper job of designing the integrated circuit, will provide a useful input and output for all of these connections.

THE COURT: Doesn't the integrated circuit also involve putting a great deal more things in the same physical space than formerly was the case?

THE WITNESS: That's correct, that's right.

THE COURT: And why are they able to do that, does that have something to do with the use of that chip?

THE WITNESS: Yes. This is modern technology. Science has gotten to the point now where they can make transistors occupying extremely small volume of space, and it's possible to fabricate the other basic circuit element components, resistors, capacitors, transistors, diodes, et cetera, except for inductants, which hasn't been miniaturized yet.

The basic circuit components which engineers have used since the transistor was invented are now able to be produced in integrated circuit form.

THE COURT: Does an integrated circuit perform any different function from a regular circuit?

THE WITNESS: No. I would think of it in terms of a package -- well, there are some integrated circuits which tend to be new. In other words, there is not particularly a one-to-one correspondence between each integrated circuit and the previous circuit. Many of the integrated circuits are custom-designed to provide a specific function, but there is a large repertoire of integrated circuits which represent a collection of components, providing a particular function, which was utilized by engineers.

We can think of these as being resource devices, giving us a repertoire of functions which can be performed, making it possible for the engineer to be a systems designer, and by systems I mean he can design without regard to the detailed construction inside.

THE COURT: Now, is the use of such circuits a less expensive way to produce one of these games than by using non-integrated circuits, generally speaking?

THE WITNESS: Well, it depends. I think the

cost of integrated circuits has come down. It is one of the few aspects of modern life in which prices are being reduced as fabrication techniques are improved.

I would not say it has always been so, but manufacturers are able now to package more and more functions into a single chip.

THE COURT: Why, in your opinion, does Paddle Ball use integrated circuits, whereas Odyssey does not?

THE WITNESS: Mr. Baer testified to that point adequately, I think, that at the time they began the development, integrated circuits were very expensive, and they consumed too much power to be compatible with a battery-operated TV game.

THE COURT: All right.

MR. ANDERSON: Your Honor, I hesitate to make this book an exhibit, but we just have in the courtroom, and I don't think Mr. Goldenberg will sense any impropriety, a book of Fairchild Integrated Circuits. Dr. Ribbens might just show how the relationship of the physical device fits in with what we are talking about here and what is inside of one typical --

THE COURT: I think actually I have sufficient

information on that for our purposes here.

MR. ANDERSON: There are many integrated circuits, as the Court can see.

THE WITNESS: An engineer designs with a book such as this, and he can read the specifications and find the component he wants to perform the function. So it is not necessary for him to buy a group of transistors or diodes or capacitors any more. He buys integrated circuits, provides the power supply, and input and output connections, and it simplifies and makes his job much simpler, in a sense.

BY MR. ANDERSON:

Q Do any of the integrated circuits, for example, include flip-flops?

A Yes. For example, I see one right off the bat. C8A and C8B are J-K flip-flops. A J-K flip-flop is one case of a flip-flop. That is one example.

Q Would you indicate on the record what area of the drawing that particular flip-flop appears?

A The upper central portion. I have identified the components as C8A. Also, component A5B is a so-called D-type flip-flop. It may be incorrectly labeled on this diagram. They have it written as a 7477, and it needs to be a 7474. I think there are some mistakes on this circuit diagram. It is hard to read, but it looks like 7477 or 7479, and it has to be a 7474.

Just below it component A5A is better labeled, and is easier to read, and that is a 7474, which is a D-type flip-flop, "flip-flop" implying a binary valued device. That is, two stable states, which can be triggered by some input signal.

BY MR. ANDERSON:

Q You might explain the significance of a flip-flop in the various circuits that we have discussed. You have mentioned a --

A It is binary valued. That is, the output

switches from one state to the other, depending on the input command.

Q Is it in the nature of an electronic switch comparable to a two-position wall switch?

A I think that is stretching it a bit, because I think it is more versatile than that.

One of the aspects of its behavior is that it has two states analogous to a switch, but I think that is underestimating its capability.

Q Dr. Ribbens, I would like to actually refer to specific phrases from the claims of the Reissue Patent 28,598, and if you can -- excuse me. I am referring to Reissue Patent 28,507. That is what I meant. I misspoke.

In fact, before we do that, I think I would like to refer to the other circuit diagrams that are in the class that plaintiffs have designated as Group A. Paddle Ball is in Group A.

Were you involved in the selection of particular games and the placement of them in particular groups?

A To some extent.

Q What was your involvement?

A Identifying the features of the game, which would make it possible to be classified. Also I helped

to identify components which read against certain claims.

Q Now, in Group A, in the agreed statement of facts, paragraph 28, the plaintiffs have placed Pong, Paddle Ball, TV Ping Pong and Wham Bam.

Have you considered the circuit diagrams of Pong, Paddle Ball and TV Ping Pong?

A Yes, I have.

Q As well as the agreed statement of facts?

A Yes, I have. Not Wham Bam, though.

Q Not Wham Bam? They have no schematic diagram of the game Wham Bam, your Honor.

Have you considered the literature which is available on Wham Bam and the stipulated statement of facts?

A Yes.

Q And from your analysis of the information available to you, what is the significance of placing them all in Group A?

A The significance is that they are games, ping pong type games, with a ball and pair of paddles, two or four paddles, in which there is an interactive game being played, but in which there are no fixed visible barriers from which the ball can bounce.

Q I would like, then, to ask you with respect to the elements of Claim 51 specifically do you find in your study of the games in Group A an apparatus for generating symbols upon the screen of a television receiver to be manipulated by at least one participant?

A Yes, I have.

Q Can you just generally state how you find that portion?

A I think Exhibit 91-A depicts for basically the entire group the technique for displaying a symbol. It is the portion outlined in purple on Exhibit 91-A. This generates an output signal which displays a symbol on the television receiver screen which is under player control, as I described earlier, by virtue of his control over the potentiometer labeled "Left, 5K" at the upper left of 91-A.

MR. ANDERSON: Your Honor, of the documents which I handed up to the Court relating to the game Paddle Ball, one is Plaintiffs' Exhibit 41-D, which is a schematic diagram of the Zenith television receiver, which was a part of at least some of the production of Paddle Ball.

Is that correct, Mr. Goldenberg?

MR. GOLDENBERG: Yes, your Honor. That is

correct.

Well, I am sorry. It is not correct.

What is correct, your Honor, and we will have testimony on this, is that in connection with the defendants' games, TV receivers were purchased by the defendant, and indeed that is one such there (indicating), but in actual production the television set was disenabled from operating as a television receiver and became, as we will show you, a television monitor, which is not a device capable of receiving television signals from a broadcast station and displaying them.

If one hooked that device (indicating) in its present form up to your home television antenna, you would not get a picture.

So when the Court will get that evidence I can't say right now, and I cannot, therefore, quite agree to Mr. Anderson's statement.

THE COURT: Why don't we, to avoid misunderstanding, use the term "television set" with the understanding that you don't mean necessarily the same thing by it in your games as Mr. Anderson does, and in that way you won't have to feel that you are being compromised.

MR. GOLDENBERG: I have no problem as long as we have that understanding.

MR. ANDERSON Very fine, your Honor. Thank you.

BY MR. ANDERSON:

Q Again with respect to the language of claim 51, Dr. Ribbens, do you find in the Paddle Ball game means for generating a hitting symbol?

A Hitting symbol?

Q A hitting symbol.

A I thought I answered that question. Perhaps I misunderstood your question.

The hitting symbol is the portion of components of Exhibit 91-A outlined with purple and labeled "Hitting Symbol."

Was your first question relating to hit symbol or hitting symbol?

Q Either. It was just the preamble, which said that the subject matter was apparatus for generating symbols upon the screen of a television receiver to be manipulated by at least one participant.

A Yes.

MR. GOLDENBERG: Mr. Anderson, are you reading from a particular patent claim?

MR. ANDERSON: I am reading from Claim 51.

MR. GOLDENBERG: Of the '507 patent?

MR. ANDERSON: Of the '507 patent.

THE COURT: Are you now going into that?

MR. ANDERSON: Yes, your Honor. I'm sorry. I didn't make that clear.

THE COURT: I knew you were going to, but I didn't know you had started.

(There was a short interruption, after which the following further proceedings were had herein:)

THE COURT: At what page is that?

MR. ANDERSON: Column 31 of Reissue Patent 28,507.

We will look at several claims and specific elements, but I have started with Claim 51.

BY MR. ANDERSON:

Q Dr. Ribbens, again I would ask whether you find in Paddle Ball an apparatus for generating symbols upon the screen of a television receiver to be manipulated by at least one participant?

A Yes.

Q If so, will you please point out where?

A The hitting symbol generator outlined in purple is one such symbol generator.

Q I am still in the preamble. I have not gotten to the means for generating the signals yet. But just

apparatus -- well, I guess you are right. Apparatus for generating symbols upon the screen of a television receiver to be manipulated by at least one participant.

You point out that a participant manipulates--

A A hitting symbol.

Q -- through the --

A Through the control potentiometer in the upper left.

Q How does that manipulation produce manipulation on the screen of the television receiver, just in the broadest sense?

A It changes the time delay from the vertical synchronizing pulse to the time of occurrence of the output signal of that group of components.

Q Where does the result appear as an output in the circuit diagram of Exhibit 91-A?

A It appears at the point labeled "Video", with a rectangular position described as "19", the 5 micro-farad capacitor.

Q What is done with that signal?

A That is sent to the receiver.

Q Do you find in the Paddle Ball game used with the television set means for generating a hitting symbol?

A Yes. The purple outlined portion.

Q Do you find in the Paddle Ball accused game, used with the Zenith television set or any television set, means for generating a hit symbol?

A The portion outlined with the solid orange line, both at the bottom and at the top, given the label "Hit symbol". It is the solid outlined portion.

Q Would those circuits that you have just identified operate any differently, depending on what type of TV display or TV set was used?

A No.

Q Will you please state whether you have found in the Paddle Ball game means for ascertaining coincidence between said hitting symbol and said hit symbol?

A I have.

Q Would you point out where in the circuit diagram or television receiver you find that?

A The rectangle outlined with a dashed orange line in the upper hit symbol block, and in this portion, is labeled "Hit/Hitting coincidence".

Q Do you find in the accused Paddle Ball game, used with a television set means for imparting a distinct motion to said hit symbol upon coincidence?

A I have.

Q Will you point out where you find that element?

A Beginning once again in the upper solid orange

outline portion, labeled "Hit symbol", there is a second rectangle outlined in a dashed orange color, labeled "Impart distinct motion (horizontal)".

In addition, in the lower solid orange outlined portion, labeled "Hit symbol", there is a block outlined with a dashed orange line labeled "Impart distinct motion (horizontal)" and a second somewhat larger outlined portion, outlined in dashed orange, labeled "Impart distinct motion (vertical)".

So the imparting distinct motion of the hit symbol operates on the vertical motion and the horizontal motion separately.

MR. ANDERSON: Your Honor, that constitutes the elements of claim 51. I also would refer to claim 45.

BY MR. ANDERSON:

Q Dr. Ribbens --

THE COURT: Maybe you have a different format in mind, but are you also going to tie in these other games to the same claims?

MR. ANDERSON: The other games in Group A, your Honor?

THE COURT: Yes.

MR. ANDERSON: I have had Dr. Ribbens testify with respect to his comparison of all of the

games in that group.

THE COURT: You think the infringement of the claims would be implied by his previous answer?

MR. ANDERSON: Well --

THE COURT: I do not say it is not. But I was going to suggest that if you were going to ask him specifically, you might do it as you go along.

MR. ANDERSON: Yes.

BY MR. ANDERSON:

Q Dr. Ribbens, with respect to the Chicago Dynamics game TV Ping Pong, would your application of the various phrases that I have asked you about apply to the circuit diagram of TV Ping Pong and, if so, how?

A Yes. I find the same sets of components.

THE COURT: Why don't you just ask whether there is any set of or rather whether there is any -- ask him whether there is anything in all of the Class A games that have the elements described in claim 51, or something to that effect.

MR. ANDERSON: Rather than go through them one at a time?

THE COURT: Right. Rather than go through them one at a time. If any of them does not, he

can describe which does not and why not.

BY MR. ANDERSON:

Q Dr. Ribbens, in your opinion, do each of the games of Group A, Pong, Paddle Ball, TV Ping Pong and Wham Bam, include all of the elements of the claims that you have just applied to the game Paddle Ball?

A Yes.

Q Do they apply in the same or in a different way?

A Essentially the same way. In many cases, identical components appear.

Q With respect to the game Wham Bam, where you indicated you had not actually had a schematic diagram in front of you, what is the basis for your statement with respect to Wham Bam?

A Descriptions in deposition and a functional description of the game.

THE COURT: Perhaps we could do it this way, too: You might ask the Doctor at the conclusion of his testimony whether he would give the same testimony as to all Class A games, and in that way you don't even have to ask him with respect to each claim. I am assuming that the answer is going to be yes. I just am trying to find a shorthand way of getting that into the record.

If it is not "yes", then by all means correct me.

BY MR. ANDERSON:

Q Dr. Ribbens, I would like to hand you a copy of Plaintiff's Exhibit 12A, which is the schematic diagram of this game Pong. Have you made a comparison between the schematic diagram of the game Pong and the schematic diagram of the game Paddle Ball?

A Yes, I have.

Q Can you tell me what you have found in that comparison?

A These are very close to the same, almost component by component. The components are drawn at different locations, your Honor, between Exhibit 12A and Exhibit 91A, with respect to the schematic.

Q You mean on the piece of paper?

A Yes. On the schematic. But in many cases the components are located identically on the printed circuit-board as identified by the coding scheme.

For example, the oscillator and the counting chain -- the output of the oscillator goes to a component called E6 in Exhibit 12-A and E6D in 91-A. E6 is a color coding scheme which identifies on a rectangular matrix one row, being numbers, and the columns being letters, of the location on the printed circuitboard as you examined it earlier, of the location of the components.

From that there is a connection to a 7474 which is a D-type Flip-Flop, and there is also a connection to a 7493, which is very similar to the 91-A.

The component is labeled F8 in 91-A, and that is the 7473 counter; and it is labeled F8, and it is also a 7493, in the Pong game.

So there are a great many similarities.

Q Are the various components in the two diagrams shown as located at these same locations such as F8 on the actual physical device?

A Yes. In Pong the first 7493 of the horizontal sync generator is labeled F8. That is Exhibit 12-A. And Exhibit 91-A, that first component is also labeled F8,

indicating it is the same location on the printed circuit-board.

THE COURT: Is that what those letters and numbers mean, that it has to do with location?

THE WITNESS: Yes.

MR. ANDERSON: Mr. Williams has pulled the circuit-board out of the Pong game of Plaintiffs' Exhibit 10.
BY MR. ANDERSON:

Q Dr. Ribbens, can you explain for the Court how the locations of the various integrated circuits are identified and determined?

A I call your attention to this printed circuit. The location across the top. There are a series of letters from A through H, which indicate a row. Excuse me. It is a column with respect to your viewpoint. And a series of numbers down the left edge, which identify rows.

This can be viewed as a matrix for identifying the location.

So F8 would be the component in the column of row 8, which is that component (indicating), and it is a 7493, as described by the circuit diagram. It is a 4-bit binary counter.

THE COURT: 7493 is a catalog number for that circuit?

THE WITNESS: That's correct. In the Fairchild catalog you would find 7493 listed as a 4-bit binary counter. And so on for the other components.

So it is an identification scheme used by, I believe, most manufacturers of printed circuits.

BY MR. ANDERSON:

Q In your consideration of the actual Pong board and the Pong circuit diagram and the circuit diagram of the accused Paddle Ball game, Plaintiffs' Exhibit 91-A, did you notice any different locations of the respective component parts on the actual boards in the two devices?

A I don't recall finding any differences. There are some errors on the circuit diagram. That is the only thing I am aware of.

Q Of 91-A?

A Of 91-A.

THE COURT: Do the same errors appear on the two diagrams?

THE WITNESS: Let me look. I will find it in a second. I don't know offhand.

One was an exclusive OR Gate, 7483, which determines the pre-load on the vertical counter chain. It takes me just a second to find that.

No, on Pong it is correctly labeled as a

7486, which is an exclusive OR Gate. I happen to remember that is the correct number designation. So the error is in the Paddle Ball game diagram, Exhibit 91-A.

BY MR. ANDERSON:

Q Dr. Ribbens, I would like you to look at the circuit diagram of the Chicago Dynamics Industry's accused game TV Ping Pong, which is Plaintiff's Exhibit 35-A, and state if you can what comparison exists between that and the Paddle Ball circuit diagram and Pong circuit diagram?

A Yes. This is also very similar. It will take me just a second to reorient to this diagram, to locate the components.

Oh, yes. Here we are.

Your Honor, this is not color coded, so it is a bit difficult -- I don't know if you can see it from your location. The components, for example, which determine the vertical position of the paddles are -- there is a 555 timer numbered B9. There is a similar 555 timer, B9, on the Paddle Ball game, which is activated by the left potentiometer.

There is a potentiometer on Exhibit 35-A which has a potentiometer labeled -- it is hard to read. Number 1 paddle. So that much is identical.

And the output of the timer goes to a 7493 counter, which is numbered B8. That is on Exhibit 35-A.

The output of the 555 timer in Paddle

Ball goes to a 7493 counter, which has the same number, B8.

I could go through component by component. There is at least a great deal of similarity. If there are differences, I believe the differences would be small.

Q Are the components in TV Ping Pong physically located by the same coding system that is used in Paddle Ball and Pong?

A Yes. They have a letter and a number designation which indicates the location on the printed circuit board in the matrix.

THE COURT: In your experience, what inference, if any, can be drawn from the fact that there is a similarity between two circuit diagrams?

THE WITNESS: From two circuit diagrams? You mean identical similarity?

THE COURT: The kind of similarity you are pointing out here.

BY MR. ANDERSON:

Q Now what you see here, Doctor.

A It looks as though one were a copy of the other.

You know, there are many ways to achieve a given result, and if I had two --

THE COURT: That is what I really was wonder-

ing. If two people were simultaneously but separately --

THE WITNESS: Independently? Yes.

THE COURT: -- seeking to achieve the same result, would they come to the same circuit diagram?

THE WITNESS: I find it highly unlikely. Particularly, if, in addition, the component locations on a printed circuit board have the same location, the same matrix numbers. I would find that highly unlikely.

I have a class, an undergraduate class, in which there are 50 students. This semester I gave them a design project for their final exam. They were to design an instrument. I would say out of the 50 there were no 2 identical solutions, except in one case, where there might have been some cheating. I'm not sure about that.

THE COURT: That is almost like asking 50 lawyers the same question.

THE WITNESS: Yes, I think so.

BY MR. ANDERSON:

Q Dr. Ribbens, referring to claim 45 and the language of that claim, do you find in the Paddle Ball game of Seeburg apparatus for playing a hockey type

game on the screen of a cathode ray tube?

A As defined by the claim, yes.

Q And do you find in that circuit means for displaying a first hitting spot?

A Yes, I do. The component outlined with a purple block labeled "Hitting symbol".

Q Do you find means for displaying a second hitting spot?

A Just above that are a group of components which are functionally identical.

Q Functionally identical to what?

A To the components of the hitting symbol.

Q Of the first hitting spot?

A Which is outlined with purple.

Q Do you find in the Paddle Ball, the accused game of Seeburg, means for displaying a hit spot?

A Yes, the portion outlined with a solid orange line.

Q Do you find means for controlling the position of the first and second hitting spots?

A Yes, I do, the potentiometers labeled "Left" and "Right" in the upper left corner of Exhibit 91-A.

Q And in the Seeburg Paddle Ball game, do you find means for controlling the position of the hit spot?

A The hit spot, yes, I do.

Q Including means for ascertaining coincidence between either of the hitting spots and the hit spot?

A Yes, I do.

Q Where do you find that?

A The dashed orange enclosed portion at the top labeled "Hit/Hitting Coincidence."

Q Now, would that detect coincidence of either of the hitting spots with the hit spot?

A Yes.

Q Do you find in the Seeburg Paddle Ball game means for imparting a distinct motion to the hit spot upon coincidence?

A I do.

Q Will you explain that, please?

A The portion of this hit symbol block, which is outlined with the solid orange. At the right, there's a rectangle enclosed with a dashed orange line, and it's labeled "Impart Distinct Motion (Horizontal)."

In the lower block outlined with a solid orange line and labeled "Hit Symbol" there's a block labeled "Impart Distinct Motion (Horizontal)." That's also outlined with a dashed orange line.

To the right of that block there are a group of components outlined with a dashed orange line labeled "Impart Distinct Motion Group."

MR. ANDERSON: Your Honor, that completes a reading of Claim 45.

THE COURT: May I just at this point refresh my own recollection as to the law relating to claims and claim infringement.

If a device infringes one claim of a patent without infringing them all, that is a case of infringement, is that --

MR. ANDERSON: Yes, your Honor, I think we would agree to that.

MR. GOLDENBERG: I think that we would agree to that, your Honor.

THE COURT: All right, that's what I thought, but I just wanted to get back on that track.

BY MR. ANDERSON:

Q Dr. Ribbens, I would like to direct your attention to additional language, particularly the language of

claim 25.

In your consideration of the game Paddle Ball as played with a TV set, do you find in combination with a standard television receiver, apparatus for generating symbols upon the screen of the receiver to be manipulated by at least one participant?

A I do.

Q And just, in general, where do you find that?

A Once again, the purple outlined region and the orange outlined portions of Exhibit 91-A.

Q And where do you find those in conjunction with a standard television receiver for generating symbols upon the screen of the receiver to be manipulated by at least one participant?

A Say that again?

Q Where do you find in Paddle Ball apparatus for generating symbols upon the screen of the television receiver to be manipulated by at least one of the participants?

A I thought I answered that. The portion outlined in purple which is labeled "Hitting Symbol."

Also the portion outlined in solid orange, labeled "Hit Symbol," the outputs of which are shown with the yellow lines, and which move and combine with the

horizontal synchronizing pulses and act as a video output and go to the television receiver.

MR. ANDERSON: Your Honor, the remainder of the elements of claim 25, I think, are substantially identical to the elements of claim 51, and I will not go through them. The record, I think will show that the language is substantially the same.

BY MR. ANDERSON:

Q Dr. Ribbens, I would like to now refer to the language of Claim 60 of Reissue Patent 28,507, the preamble in particular.

In Paddle Ball, when used with a TV set, do you find apparatus for playing games by displaying and manipulating symbols on the screen of a cathode ray tube?

A I do.

Q Do you find means for generating vertical and horizontal synchronization signals?

A Yes, I do.

Q Would you point out just in general on the exhibits that are appropriate where you find that?

A The components in which the horizontal and vertical synchronizing signals are produced are identified by the termination of the blue line and the red line

as drawn on Exhibit 91-A, specifically component G5A produces the vertical synchronizing pulse, and H5B produces the horizontal synchronizing pulse.

Q Do you find in Seeburg's Paddle Ball game means responsive to the synchronization signals for deflecting the beam of the cathode ray tube to generate a raster on the screen?

A Yes.

Q Where do you find that?

A If this signal is supplied to a television set, then, in respect to the horizontal and vertical synchronizing pulses, the television set will be caused to display a raster.

Q I show you Plaintiff's Exhibit 41-D. Would those elements be shown in Exhibit 41-D, the circuit diagram of a Zenith?

A Yes, they would. They are labeled --

Q Are they?

A Yes.

MR. GOLDENBERG: Your Honor, I apologize for not raising this sooner, but I object to any questioning of this witness with respect to claim 60 of this patent...

We stipulated, your Honor, that this Paddle Ball game was sold after the issuance of the '284 patent, which is the original of the '507 Reissue. We have not stipulated, because we believe it to be the fact, that

the Paddle Ball game was not sold after the issuance of the '507 Reissue, and claim 60 is a reissue claim.

THE COURT: Well, I think that would go not to the admissibility of the evidence, but rather whether the plaintiff is able to show liability, so --

MR. GOLDENBERG: Well, I make my objection for the record, your Honor.

THE COURT: Yes, yes.

MR. GOLDENBERG: It's taking up the Court's time unnecessarily in connection with this game.

THE COURT: Well, are there any other of these Group A games that were sold, by the defendants' admission, after --

MR. GOLDENBERG: After the Reissue, no, your Honor.

THE COURT: -- after the reissue?

MR. ANDERSON: Your Honor, I think that's somewhat uncertain. TV Ping Pong made by CDI apparently was not manufactured by CDI afterward, but I think both Seeburg and World Wide have leasing businesses, which would keep the claims -- keep the liability running even after it was manufactured.

THE COURT: In the event of a verdict or judgment favorable to the plaintiff on liability, then all these matters would have to be gone into on the damage aspect of the case, at which time it would become necessary to determine what was sold, and when.

MR. GOLDENBERG: Well, as I said, your Honor, I make my objection for the record at this time.

THE COURT: Right, I understand.

BY MR. ANDERSON:

Q Dr. Ribbens, in the Paddle Ball game of Seeburg, do you find means coupled to the synchronization signal generating means and said cathode ray tube for generating a first symbol on said screen at a position which is directly controlled by the player?

A Yes.

Q Where do you find that?

A That's the portion outlined with purple on Exhibit 91-A, labeled "Hitting symbol".

Q Do you find means coupled to said synchronization signal generating means and the cathode ray tube for generating a second symbol on the screen which is movable?

A Yes, the portion outlined in orange, labeled "Hit symbol".

THE COURT: Let me go back to that matter again.

Have the parties completed their discovery on the damage aspect of this case, or has that been delayed until after the liability?

MR. GOLDENBERG: The latter is the case.

MR. ANDERSON: The latter is the case.

THE COURT: All the more reason I think for allowing them to go into it at this point, because they really don't know or have a basis for knowing --

MR. GOLDENBERG: Well, your Honor, except that they do have a burden of proving infringement, and we submit, you know, that they did take discovery with respect to the original patent, the '284 patent. They attempted no discovery, or attempt to prove any kind of sale, even one sale, of that game, after the Reissue came out.

THE COURT: That is interesting. You do have to show a sale to show an infringement, I guess.

MR. ANDERSON: Your Honor, we would try to determine that informally, and I might say that with respect to other games, I think Seeburg has definitely leased or sold games that are accused that were made and sold after the Reissues, if I'm not mistaken.

MR. GOLDENBERG: Your Honor, we are talking about Paddle Ball, the Group A type games, and that's not so.

THE COURT: Well, all right. I will let this in, but I certainly understand the defendants' point that they are not admitting any sales. All right.

BY MR. ANDERSON:

Q Dr. Ribbens, you just referred to means for generating a second symbol on the screen which is movable, and the next element of claim 60, do you find in Paddle Ball of Seeburg means coupled to the first symbol generating means and the second symbol generating means for determining a first coincidence between the first symbol and the second symbol?

A Yes, I do. That's this orange dashed enclosed portion on Exhibit 91-A which is labeled "Hit/Hitting coincidence".

Q And do you find, in Paddle Ball of Seeburg, means coupled to said coincidence determining means and the second symbol generating means for imparting a distinct motion to the second symbol in response to the coincidence?

A Yes, I do, the portion outlined in dashed orange, labeled "Impart Distinct Motion (Horizontal)"

consisting of the rectangle in the upper hit symbol, the rectangle in the lower hit symbol toward the right, and the rectangle outlined -- excuse me -- the portion outlined with a dashed orange line to the left of the lower hit symbol which is labeled "Impart Distinct Motion (Vertical)".

MR. ANDERSON: Claim 61, your Honor, is a dependent claim on claim 60, and I think we can probably agree that every element of claim 60 must be found in order to make claim 61 read, and, in addition to that, the elements cited in claim 61 must also be present, so that I will ask Dr. Ribbens about the specific elements of claim 61.

BY MR. ANDERSON:

Q Dr. Ribbens, do you find in the Paddle Ball game means coupled to the synchronization signal generating means and the cathode ray tube for generating a third symbol on the screen at a position which is controlled by a player?

A Yes, it's the circuit components above the portion outlined in purple, essentially a second hitting symbol, this set of components at the upper left portion of Exhibit 91-A.

Q Do you find in Paddle Ball means coupled to

said third symbol generating means and the second symbol generating means for determining a second coincidence between the third symbol and the second symbol?

A Yes. That's this rectangle outlined in dashed orange, labeled "Hit/Hitting Coincidence."

Q Do you find means coupled to the second and third symbol coincidence determining means and the second symbol generating means for imparting a distinct motion to the second symbol in response to the second coincidence?

A Once again, yes, the portion of the hit symbol outlined with a dashed orange line which is labeled "Impart Distinct Motion (Horizontal)" at the top, and near the bottom there's a similar rectangle, "Impart Distinct Motion (Horizontal)" and to the left of that the orange dashed outline portion labeled "Impart Distinct Motion (Vertical)".

Q Would you, from your study of the various claims in Group A apply all of the claim elements that you have described to the games in Group A in the same manner that you have just described with respect to Paddle Ball?

A Yes.

Ribbens - direct

MR. ANDERSON: Your Honor, we would now like to direct the Court's attention to Group B of the plaintiffs' classifications.

BY MR. ANDERSON:

Q Dr. Ribbens, have you made a study of the Pro Tennis circuit diagrams and other literature?

A Yes, I have.

Q Have you made a comparison between Pro Tennis and the patents in suit?

A Yes, I have.

Q Have you prepared a colored chart with respect to Seeburg's Pro Tennis game?

A Yes. That's labeled Exhibit 91-B.

Q Dr. Ribbens, will you please explain in general the game Pro Tennis as it's shown on Exhibit 91-B?

A Yes. This is a four-player game. It's not a two -- two or four, depending on the number of coins that were inserted.

If I can direct your attention to a portion of the circuit diagram outlined in purple and labeled "Hitting Symbol," this group of components functions in such a way as to provide a signal pulse which appears in the output of the device.

If you follow the yellow line which goes

from the hitting symbol down to a brown outlined portion near the center of the circuit diagram, you will find a group of components -- this brown outlined portion is labeled "Display." There's an arrow leading to the right, labeled "To Video Out Capacitor Positive." This is the output of the entire circuit which goes to the television receiver.

Similarly, there are a group of components outlined with a solid orange line at the bottom of the circuit diagram. The output of this group of components is the yellow line which begins -- if I can direct your attention to the circuit diagram -- with a component which is labeled "Ball Generator." That's the termination of the yellow line and the hit symbol.

Following that yellow line up to the portion labeled "Display," and outlined in brown, there are means, as we will explain, for delivering the signal generated by the hit symbol to the output.

The hit symbol is capable of generating a signal pulse which -- in relationship to the horizontal and vertical synchronizing pulses -- whose time delay relative to those synchronizing pulses is such as to cause the motion of the ball -- the motion of this symbol to move, analogous to a ball.

Ribbens - direct

In addition there are groups of components outlined in solid green labeled "Fixed Hit Symbol."

This fixed hit symbol would display on the screen of the television receiver top and bottom lines and the circuit, as we will explain, is such to cause the ball to appear to bounce off the top and the bottom lines when coincident with them.

The symbol -- excuse me -- the signal which comes from the group of components labeled "Hitting Symbol" can be moved in time, and, therefore, moved in space on the face of the cathode ray tube by virtue of a control which the player has at his disposal.

You will find a component, a potentiometer, just to the upper left of the hitting symbol, a potentiometer which has the numbers 5000 written next to it. There's also an arrow connecting it with a block with a 7 inscribed.

The labeling on Exhibit 91-B for that potentiometer is RR, presumably indicating right rear, and is the control which the player has over the position of this symbol.

By varying that position of that potentiometer, he can cause the symbol to move up and down on the display of the television receiver.

There are four such hitting symbol

generators, though only one is outlined in purple. The horizontal position of that symbol is fixed in this game.

In addition, there are groups of components, those which are outlined with a solid orange line, which generate a signal, as I explained, which moves across the face of the TV picture tube analogous to the ball.

So, at least two players would be involved in the game, and they would attempt to manipulate the position of their hitting symbol so as to intercept the path of the ball.

When the path of the ball is intercepted and coincidence occurs, the motion of the ball is altered. If in the course of the motion of the ball across the TV picture tube it reaches coincidence with either the top or the bottom lines, the ball motion is altered in such a way that it would appear to bounce off those lines.

Let's see. I don't know if I have overlooked anything.

There is a portion of this circuit which causes this movable hit symbol to move away from either the paddles or the top or bottom lines after coincidence has been reached.

THE COURT: What is the common feature of the category B games?

THE WITNESS: The common feature is the fixed visible barrier which we have identified on Exhibit 91-B as the portion -- the circuit components outlined in solid green and labeled "Fixed Hit Symbol".

BY MR. ANDERSON:

Q How do you distinguish Group B from Group A?

A In Group A, this would not be displayed.

Q What is the relationship between Group A and Group B games?

A Well, otherwise the operation is very much the same, that is, the hitting symbol is movable vertically, the hit symbol moves in a similar manner. In fact, the components which provide the motion of the hitting symbol and the hit symbol are virtually identical.

Q Now, Dr. Ribbens, I'm not sure the record is clear on what you were comparing in that last answer. Will you please repeat it and be specific? What are you comparing to that?

A I am comparing the components and their function in the games of category B as represented by the game Pro Tennis, Exhibit 91-B, with the games

of Group A, as represented by the schematic of Paddle Ball.

Q All right, run through that comparison, the relationship between the portions that you described in Group A and Group B for the hit and hitting symbols.

A The principal difference is the display of a fixed hit symbol. The similarities are in the means of controlling the vertical and horizontal position of the hit symbol and in controlling the vertical position of the hitting symbol, virtually identical components are used --

Q In --

A -- in both cases, Group A and B, that is, both Exhibit 91-A and 91-B.

Also the coincidence detecting circuits are identical. They both use two input NAND gates.

THE COURT: Is the generation of the fixed hit symbol in the category B games done in any way that is different from the generation of either the hit or hitting symbols in the category A games?

THE WITNESS: Not really, in the sense that they are derived from the horizontal and vertical synchronizing pulses, as taught by patent 28,598 Reissue. In fact, I think that raises a good question. Your question is good, because referring

to Exhibit 90, you will see that, as taught by '598, there is a symbol generator which is identified as Wall Generator in Figure 12A of Patent '598 Reissue, and its position is determined in relationship to the synchronizing pulses.

BY MR. ANDERSON:

Q Now, would that find correspondence in Plaintiff's Exhibit 91-B, the Pro Tennis logic diagram, Dr. Ribbens?

A Yes. Something I didn't mention, and perhaps should have, is the top portion of Exhibit 91-B consists of a group of components which are basically frequency generators. They generate signals which bear a definite relationship to the frequency of the master oscillator, which is at the upper left, and is labeled "Crystal Oscillator" in Exhibit 91-B. These components provide a series of square waves, if you will, of definite frequency. Among their operations is the generation of the horizontal sync which is indicated on Exhibit 91-B by a red line beginning at the component -- can't read that very well -- I think it's D11 -- can you read it? I can't read it.

MR. ANDERSON: Yes, I would say it's D11.

BY THE WITNESS:

A -- D11.

The red line beginning at that component, passing over through a component labeled A4 and exclusive OR, to the output, and if you follow the red line, that indicates the path of the horizontal synchronizing pulse.

Similarly, the vertical synchronizing pulse is generated from this set of frequency components, this frequency divider chain, as we would refer to it, indicated by the blue line, beginning with G5, passing through the exclusive OR, to the output, the output being indicated on this figure by the rectangle outlined in solid brown at the right-hand portion and labeled "Display" -- that is, we have labeled it "Display".

Exhibit 91-B carries a label "Picture."
Just below "Picture" is a symbol from capacitor. Below that are the numbers 4.7 microferalytic, indicating an electrolytic capacitor.

THE COURT: In what has been marked Exhibit 43-B, the brochure concerning Pro Tennis, there is, on the TV screen, what appears to be something that would represent a net. Is that the fixed hitting symbol?

THE WITNESS: No, no, there is a separate generator. I haven't outlined it because I don't believe it bears on the issues.

BY MR. ANDERSON:

Q In the drawing, Dr. Ribbens -- in the color brochure, what would constitute -- is it Exhibit 43-B?

THE COURT: 43-B.

BY MR. ANDERSON:

Q -- what would constitute the fixed hitting symbols you have been talking about?

A The top and bottom lines as displayed on the picture, these horozintal white lines. This is presumably for cosmetic purposes and takes no part in the play of the game.

Q There you are referring to the vertical line?

THE COURT: I was thinking about the ball hitting

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the net, it would bounce off.

THE WITNESS: No.

MR. ANDERSON: The simulation isn't quite that good, your Honor.

THE WITNESS: No.

MR. ANDERSON: Would it be appropriate at this time, your Honor, to turn on the Pro Tennis game, which is Exhibit 43?

THE COURT: Yes. I have never seen that.

MR. ANDERSON: It's 43-E.

THE COURT: The only one of these games I have ever really played is the automobile game.

THE COURT: All right.

MR. ANDERSON: Your Honor, we now have received from our office the complete corrected signed stipulation with respect to the glossary, and I will hand you the original and an extra copy, if you would like to have it.

Also, we have turned on both the Pong game and the Pro Tennis game, and I think perhaps if the Court would like to see them operated or have someone manipulate them --

THE COURT: One way we could decide this case is the best two out of three between you and Mr. Goldenberg.

MR. ANDERSON: I challenged Mr. Goldenberg --

THE COURT: And you could each choose your weapon.

MR. GOLDENBERG: Mr. Anderson made that offer, your Honor. I suggested that if that were going to be the way it were done, Mr. Rifkin should step forward in my stead. He has spent far more time at it than I.

THE COURT: He would be your second or substitute, or whatever they used to call it.

This is the way the thing looks when you simply have it plugged in to the wall?

MR. ANDERSON: Yes. Perhaps Dr. Ribbens could come down and show you how the game is played, first on Pong, which is Plaintiff's Exhibit 10, and he could point out where the various components are that make up the units of the game, and then do the same for Pro Tennis.

THE WITNESS: I am not a very good player.

(There was a brief interruption,
after which the following further
proceedings were had herein:)

MR. ANDERSON: Maybe I won't play Mr. Goldenberg after all.

THE COURT: The paddle is certainly quite small --

MR. ANDERSON: For the novice.

THE WITNESS: It is way too small for me.

THE COURT: The record should show that we are playing Pong at this point.

THE WITNESS: You will notice the vertical velocity depends on where on the paddle the ball hits. I was able to make the ball go down by hitting the ball at the bottom of the paddle.

THE COURT: What do you do, if anything, in Pong to impart english?

THE WITNESS: That is what I was trying to

suggest. I was not very successful, but if you can cause the paddle to intercept the ball just at the right spot, at the top or the bottom, you will notice Mr. Anderson hit it near the center of the paddle, and that caused it to go straight out.

THE COURT: Is it anything like the mechanism which in Odyssey involves a separate control for the imparting of english?

THE WITNESS: Yes, except in this particular case --

THE COURT: I know the result is the same, but is the result achieved in the same way?

THE WITNESS: This would be analogous to pre-setting the english control on the Odyssey game to a fixed value, so that when the paddle and the ball reach coincidence, the ball would come off with a particular velocity analogous to hitting the paddle in a particular segment.

I gave it a downward component, and there I gave an upward component to it, because I collided with the top of the paddle.

In rotating these knobs, I am able to influence the position of the paddle.

There I gave it a little bit of a down-

ward component.

So that is equivalent to english.

My hand coordination is not quite good
enough to beat Mr. Anderson.

MR. ANDERSON: You are beating me.

THE COURT: I have difficult conceiving how hitting-- I see. You are saying that the pre-set is really the same thing as giving an angle to the hitting spot.

THE WITNESS: Right.

THE COURT: Is that what the pre-set does?

THE WITNESS: The pre-set on the game as taught by '507 is analogous to hitting the paddle with the ball at some particular segment.

In this game the vertical motion is influenced by where on the paddle the ball reaches coincidence. So that provides a particular vertical velocity component.

The corresponding control over the vertical motion, if I were to make this game, that is, Fig. 12A of '507, similar to Pong, would be to pre-set these conditions to give either an up component of velocity or a down component of velocity.

THE COURT: In the same way, but a tilt of the hitting spot?

THE WITNESS: No. By -- well, then the vertical motion would be determined simply by coincidence with the ball and the paddle. Immediately after coincidence, you may recall, we changed control over

the vertical motion from one player to the other, and in the way in which the game can be played, the player has continuous control over its motion. After he has successfully completed coincidence, he can rotate his knob and cause the vertical motion to move continuously, whereas to make it analogous to the Pong game, in which coincidence is reached, the player has no further control over the vertical motion.

He has control over the vertical motion to the extent he can control where on the paddle the coincidence takes place. On the top, it tends to go up. In the middle, it tends to go straight out. The bottom, it does down.

That would be roughly analogous in the game illustrated in '507 to presetting the control.

BY MR. ANDERSON:

Q Those are the controls 127 or 128?

A Right. The English controls 127 or 128.

Q Then if, say, Player A presets the knob 127, which is his English control, in Fig. 12A of Patent '507, when does that effect take effect? When does that setting take effect on the play of the game?

A After coincidence has been reached.

Q After Player A intercepts the ball?

A If Player A reaches coincidence, the vertical

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velocity component, as set by his knob 127, takes effect.

Q How does that compare with the action in the Group A game, such as Pong and Paddle Ball?

A In these games, the vertical component of velocity is influenced by the point of coincidence on the paddle.

Q Does that take effect when that player intercepts the ball?

A Yes. It takes place only at coincidence. At coincidence the circuitry reads on the portion of the paddle at which coincidence takes place, and then through some circuitry -- I can describe this in detail if you wish, but essentially it presets a vertical counter which determines the vertical component of velocity. So it is at the point of coincidence that that action takes place.

Q Dr. Ribbens, you already have referred to the back of the Pong game, Plaintiff's Exhibit 10, with respect to the printed circuit boards. Perhaps you can point out the overall system of components of the game.

A Yes. There is the coin box --

(There was a brief interruption,
after which the following further
proceedings were had herein:)

BY THE WITNESS:

A If you will look in, there is a switch which is operated by coins being inserted, which starts the game, and which gives credit to the players.

BY MR. ANDERSON:

Q Where do the coins go?

A I guess they go in this box here (indicating).

Q That is a baking tin, the way it looks, is that right?

A I don't know what it is. It looks like a baking tin.

THE COURT: Your question had to do with where the coins go initially, I take it.

MR. ANDERSON: That's right.

BY THE WITNESS:

A We have no doubt about their ultimate destina-

tion.

Then if you look -- it is a little hard to see, but the potentiometers -- you may recall from your previous case that these are controls here, the knobs, the shaft from the potentiometer extending through this panel and being attached to the knob of the other side.

These are connected to the printed circuit panels. These are where all the generation of the symbols take place and control over the position of the symbols takes place.

Then there is a lead which comes from the board and connects to the television receiver, and it is shown -- it is being connected to a pair of screw terminals on the back. They happen to be labeled UHF, but without having this set apart, I am sure that this does not go into the UHF tuner, because this is a video signal coming out of here. I have had an oscilloscope across here, and it is just a pure video signal. Someone has disassembled the leads from the UHF inside and has run the leads to the video amplifier.

THE COURT: Is the set inside that Pong game capable of receiving regular TV signals?

THE WITNESS: Not at the moment.

THE COURT: What would you have to do to make

it so capable?

THE WITNESS: It depends on what was disconnected. If someone just simply cut these leads, the leads that go from the screw terminals to the UHF tuner, they would simply have to be reconnected, and then the leads from this pair of terminals to the video amplifier would have to be disconnected.

So I think it would probably involve cutting four wires and reconnecting, or cutting two wires and reconnecting two wires. But without taking it apart, I can't know exactly what may be done. There may be some parts of the circuit which have been removed, but I can't tell that from an external inspection.

MR. ANDERSON: Just for the record, the television set in the Pong game, Exhibit 10, has a label which reads "Hitachi, Transistor TV Receiver, Model P-02".

MR. WILLIAMS: The tuner is still in, but the knobs have been taken off.

BY MR. ANDERSON:

Q Dr. Ribbens, perhaps you can similarly explain the Pro Tennis physical exhibit, Plaintiff's Exhibit 43-E, which is in the courtroom here.

(There was a brief interruption, after which the following further proceedings were had herein;)

THE WITNESS: The play of the game is identical. There are a pair of potentiometers connected to these knobs which control a time delay from the vertical synchronizing pulse, which determine the vertical position of the paddle. You will note there are a number of lines displayed in the paddle, and also the velocity component of the ball is determined by where in the paddle -- you will notice at the moment the ball is going back and forth -- I can give it a vertical component by having the ball intersect at the top of the paddle. That's equivalent to a preset english. There, I gave it even higher. Slightly lower. That's the maximum vertical. I got a point, finally.

So, you know, the play of the game is basically the same, except that if we were to activate the next play, we could have four players.

THE COURT: Does that fixed hitting spot along the sidelines have any function other than decorative?

THE WITNESS: I'm sorry, what was your question?

THE COURT: Does the fixed hitting spot have any function in the game other than to decorate --

THE WITNESS: This one?

THE COURT: Yes.

THE WITNESS: Oh, yes. It bounces --

THE COURT: Yes, I understand, but it bounces in Pong without the display.

THE WITNESS: Oh, yes, this gives it a picture, makes it more graphical, I think.

BY MR. ANDERSON:

Q Dr. Ribbens, is it possible to see the scan lines of the television set in Plaintiff's Exhibit 43-E?

A This television receiver is adjusted such that during the blanking level, the picture is not completely turned off, and you can see the lines that are displayed, the 261 or 262, however many happen to be displayed.

THE COURT: What are the vertical lines that we see there on the screen?

THE WITNESS: There's some modulation component on the horizontal sync. It's not absolutely constant during horizontal sweep. Ideally we would like to have the signal blank during that portion, but there's some signal present, and the signal is fluctuating.

Notice the time between synchronizing pulses is the time from the left to the right edge, and instead of that being a constant,

there's some fluctuation along there causing the signal to vary.

BY MR. ANDERSON:

Q In the nature of noise?

A Yes, I guess it probably is noise, either in the receiver or -- well, it's hard to say exactly where it occurred.

MR. ANDERSON: Perhaps we can look at the backside of this one also, Dr. Ribbens, and just point out where the various basic parts of the game are mounted in the chassis of Exhibit 43-E.

THE WITNESS: This is not a good idea to expose the back of the picture tube. That's dangerous.

If you look up at the front, there's a coin mechanism which receives the coin and gives credit to the players and initiates the game play.

The potentiometers are located there at the left, and they are at the center, and there are two more on the right, and they are connected to the face panel.

The shafts are connected through the face panels to the knob. There's a master power supply over here, and this is the printed circuits which contains all the functional components for

the game.

The composite video signal with synchronizing pulse goes from here into the television receiver.

This is similar to the connection on the Pong game at the UHF terminal.

I can't really see in here to see where it's connected, but this is a vacuum tube set, so I would imagine insert tubes may have been removed to keep television signals -- from the normal antenna connections -- from interfering.

BY MR. ANDERSON:

Q Doctor, I will hand you Plaintiff's Exhibit 43-C, which is the assembly diagram of the Seeburg Pro Tennis. Perhaps from that you can explain where the various parts are in this cabinet.

A Yes. This master power supply is over on the side.

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Q That is, the lower left-hand corner of the drawing?

A Lower left-hand corner of the tray.

And then the four potentiometers under player control are the knobs -- excuse me -- are the objects which protrude through the top of the box, and those are the symbols RR, LR, RF, and LF, called player controls.

This is the television receiver.

Q That's right in the center of Exhibit 43-C?

A Right in the center of the diagram, 43-C, right.

And then the printed circuitboard is represented by the drawing at the right of Exhibit 43-C.

This indication here to the left-hand side of that drawing with a series of inscribed numbers corresponds to the terminals of the edge connector, which you might be able to see -- if I get my head out of the way -- and this connector right here has a number of connections coming from it, and those are numbered in accordance with the position on the back of the connector.

So, these provide the inputs from the player controls and the power supply and the outputs to the television receiver from the printed circuitboard, which is at the right of the actual device, and also at the right of the drawing, 43-C.

THE COURT: What is meant by the term "printed circuit" in this context?

THE WITNESS: Oh, yes, I guess we didn't show that very well.

If you look at this board, you will see that there are some metal strips, and these are prepared on the -- you start out with a board which has continuous metal coating, and then by a photographic process you can expose the chemical which is on the surface to light, and then, by placing the entire board in a solution, it dissolves away the remaining portion of the circuit -- in other words, it takes away the remaining portion of the metalization and leaves the metal strips where you want them to be. The metal strips provide the interconnection between the various components.

You start out with essentially a solid plated board, make a mask. This is something that the designer has to prepare and then photographically expose the board, and then etch away the metal.

BY MR. ANDERSON:

Q Dr. Ribbens, I hand you Plaintiffs' Exhibit 43-D, which is apparently the parts list for Pro Tennis.

Can you point out there where the TV set

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is listed, and does it correspond to the diagram?

A Well, I'm going to have to read it for a moment.

Zenith television -- yes -- item 20A-9094 says "Zenith Television complete," and I see in the back of the television receiver in this Pro Tennis "Zenith Television," so this item refers to "Zenith Television complete."

Q Is that No. 20A-9094 on Exhibit 43-C also?

A Yes, it's labeled 20A-9094, labeled "TV fused inside," and there are some other numbers which indicate the power ratings -- power requirements for the television receiver.

Q Dr. Ribbens, I would now like you to consider the Seeburg Pro Tennis game, and I would like to read various elements of the claims of the two patents in suit and ask you if you find correspondence --

A Shall I?

Q Yes, would you step down?

-- find correspondence in the group B games, and, in particular, Pro Tennis?

A Okay.

Q First I think perhaps you have heard me read with respect to the Paddle Ball game various elements of

the '507 claims, 51, 25, 45, 60 and 61. Can you state whether those elements that I read to you from the claims of '507 are found in the Pro Tennis game of Seeburg which is in group B?

A Yes, they are.

Q And can you --

THE COURT: My suggestion on that would be to let it go with that and let Mr. Goldenberg cross examine if he desires.

MR. ANDERSON: Fine.

THE COURT: I don't think I need to run through this on Pro Tennis as we did on Paddle Ball, and by that I don't mean I assume anything, but let's just let the yes answers stand.

MR. GOLDENBERG: No, I understand, your Honor, and if the witness were asked the same questions with respect to Pro Tennis on those claims, he would give the same answers.

BY MR. ANDERSON:

Q Dr. Ribbens, in Group B, are the games Sportarama, where we have not been able to obtain from the defendants a schematic diagram, and TV Hockey of Amutronics, sold by one of the defendants, where we have no schematic, have you formed an opinion with respect to the claims of '507 with respect to those two games where we do not have circuit diagrams?

A Yes.

Q And what's the basis of that opinion?

A The basis is agreed facts -- set of agreed facts that I read.

Q Have you seen the printed color brochures on that game also?

A Yes, I have seen the color brochure, and based on those, I would conclude that the game display is identical, and also in the agreed facts that I read.

Q All right, then, I would like to read to you certain elements of the claims of the '598 patent and ask you whether you find -- before I do, Dr. Ribbens, Mr. Williams has suggested maybe I didn't, in my broad question about the application of '507, cover all of the claims.

Does your testimony that the '507 claims apply in the same way that you have described as to

Paddle Ball also apply to Pro Tennis, apply to all of the claims that you have studied and are listed in the agreed statement of facts?

A Yes.

THE COURT: As comprising the Class B games, you mean?

MR. ANDERSON: As comprising the Class B games and the readability as he applied the claims of '507 to the Class A games, and Paddle Ball in particular.

THE WITNESS: Yes.

BY MR. ANDERSON:

Q That's correct. All right, then, with respect to the '598 patent, I will read to you certain elements --

THE COURT: This might be a good point to break for lunch.

MR. ANDERSON: Thank you, your Honor.

THE COURT: Approximately how much more do you have with Dr. Ribbens on direct?

MR. ANDERSON: I think very little.

THE COURT: Very little?

MR. ANDERSON: I would think less than an hour, your Honor.

THE COURT: I was going to say if another 10 minutes, we would go on, but as long as --

MR. ANDERSON: No, it will be more than 10 minutes.

THE COURT: I have a sentencing at 2:00 o'clock which will take about 10 minutes, so if you get back about 10 after 2:00, that's all right.

MR. ANDERSON: Thank you.

(Whereupon the trial of the above-entitled cause was recessed to 2:10 p.m. of the same day and date.)

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